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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,402	10/17/2001	Yoshihiro Satoh	N32040200W	6789

7590

09/12/2002

Darryl G. Walker  
WALKER & SAKO, LLP  
Suite 235  
300 South First Street  
San Jose, CA 95113

EXAMINER

RICHARDS, N DREW

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/981,402

Applicant(s)

SATO, YOSHIHIRO

Examiner

N. Drew Richards

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of claims 1-6 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the inventions are not distinct. This is not found persuasive because the product as claimed can be made by another and materially different process. For example, the product as claimed can be formed by a method that does not form an insulating layer from a gas containing carbon.

The requirement is still deemed proper and is therefore made FINAL.

***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 38 as described with figure 17. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because reference numeral 26 in figure 17 does not point to any feature of the drawing. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

4. The specification is objected to for not including a brief description of all drawings. The specification lacks a brief description for figure 4.
5. The disclosure is objected to because of the following informalities: Page 2 line 18 should read "contact" instead of "contract".
- Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claim 6 recites the limitation "the diffusion layer" in line 3. There is insufficient antecedent basis for this limitation in the claim.
8. Claim 6 recites the limitation "the first interlayer insulating film" in line 4. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. Claims 1-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's admitted prior art.

Applicant's admitted prior art, hereafter referred to as "APA", discloses in figures 16-21 a semiconductor device comprising a silicon nitride film 20,24,36,40 formed between the insulating film (not shown) and the silicon substrate 12 which prevents carbon diffusion into the substrate.

With regard to claim 2, the insulating film is disclosed on page 3 lines 8 and 9 as including tantalum oxide ( $\text{Ta}_2\text{O}_5$ ).

With regard to claim 3, the device is disclosed as being a dynamic random access memory having a memory cell capacitor film including the tantalum oxide.

With regard to claim 4, the semiconductor device includes a contact 30 which penetrates an interlayer insulating film 26 and is electrically connected with a diffusion layer in the silicon substrate (not shown), and the silicon nitride film 20,24 is formed on the silicon substrate as a carbon diffusion preventing film while traversing a region except a portion for providing the electrical connection between the contact and the diffusion layer.

With regard to claim 5, the device includes a contact 30 that penetrates a first interlayer insulating film 15 and is electrically connected with a diffusion layer (not shown) formed in the substrate and a capacitor contact 46 that is interposed between a lower electrode of the memory cell capacitor (not shown) and the contact 30 while penetrating a second interlayer insulating film 26 and a third interlayer insulating film 32, and the silicon nitride film 36,40 is formed on the third interlayer insulating film 32 while

traversing a region except a connection portion between the lower electrode and the capacitor contact.

With regard to claim 6, the device includes a contact 30 that and is electrically connected with a diffusion layer (not shown) formed in the substrate while penetrating a first interlayer insulating film 26 and the contact 30 is electrically connected to a capacitor contact 46 that is interposed between a lower electrode of the memory cell capacitor (not shown) and the contact 30 while penetrating a second interlayer insulating film 32 and a third interlayer insulating film 42 for providing an electrical connection between the lower electrode and the contact, and the silicon nitride film 36,40 is formed between the second and third interlayer insulating films.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ibok (U.S. Patent No. 6417041 B1), DeBoer et al. (U.S. Patent No. 5910880), Hanttangady et al. (U.S. Patent No. 6335239 B1), Asano et al. (U.S. Patent No. 6037207).

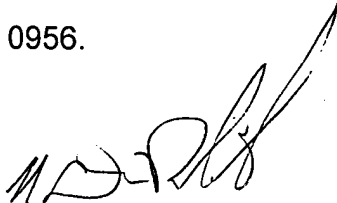
Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (703) 306-5946. The examiner can normally be reached on M-F 8:00-5:30; Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for

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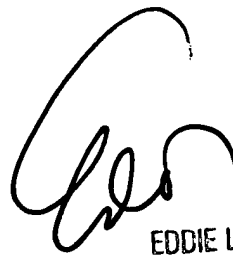
the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



NDR

September 8, 2002



EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800